Test 1

Total mark 10

Answer the following questions :

A Choose the correct answer : (8 marks)

1 We have got the refractive index of four materials, which result of the four is incorrect ? .....

ⓐ 0.8 ⓑ 1.3

ⓒ 1.5 ⓓ 1.8

2 The intensity of sound weakens as we go away from its source, because .....

ⓐ $I \alpha \frac{1}{d}$ ⓑ $I \alpha d$

ⓒ $I \alpha \frac{1}{d^2}$ ⓓ $I \alpha d^2$

3 The ..... colour in the spectrum colours has the hightest frequency.

ⓐ violet ⓑ green

ⓒ red ⓓ yellow

4 If the angle between a reflected light ray and a reflecting surface is 30°, so the angle of reflection will be equal to .....

ⓐ 15° ⓑ 30°

ⓒ 60° ⓓ 90°

B Give a reason for the following : (2 marks)

Man can't hear all sounds produced by dolphins.

.....

.....

Test 2

Total mark 10

Answer the following questions :

A Choose the correct answer : (8 marks)

1 A student rotates Savart's wheel with different velocities, the velocity which gives more rough sound is .....

ⓐ 20 rotation/sec. ⓑ 300 rotation/min.

ⓒ 6 rotation/sec. ⓓ 10 rotation/sec.

2 If the frequency of red colour is 4×10^{12} Hz, so the frequency of violet colour is ..... $\times 10^{12}$ Hz.

ⓐ 1.5 ⓑ 3.5

ⓒ 4 ⓓ 7

3 If the angle between the incident light ray and the reflected light ray is 90°, so the angle of incidence equals .....

ⓐ 0° ⓑ 30°

ⓒ 45° ⓓ 90°

4 A sound travels in air with velocity 330 metre/sec. and has a wavelength 0.1 meter, so its frequency equals .....

ⓐ 330 KHz. ⓑ 3300 Hz.

ⓒ 33 KHz. ⓓ 330 Hz.

B Give a reason for the following : (2 marks)

The light of the Sun is a complex light.

.....

.....

Test 3

Total mark 10

Answer the following questions :

A Choose the correct answer : (8 marks)

1 All of these sounds are of uniform frequency, except the sound of .....

ⓐ violin. ⓑ guitar.

ⓒ loudspeakers. ⓓ piano.

2 The distance that the light travels in one second is .....

ⓐ the light frequency. ⓑ the light speed.

ⓒ the light intensity. ⓓ the light energy.

3 Light is reflected ..... when it falls on a rough surface.

ⓐ regularly ⓑ irregularly

ⓒ and refracted ⓓ in one direction

4 The angle of incidence of light is ..... its angle of reflection.

ⓐ larger than ⓑ smaller that

ⓒ equal to ⓓ double to

B What is meant by ...? (2 marks)

Infrasonic waves.

.....

.....

Test 4

Total mark 10

Answer the following questions :

A Choose the correct answer : (8 marks)

1 As the number of teeth of the gear in Savart's wheel increases, the ..... of the produced sound increases.

ⓐ amplitude ⓑ intensity

ⓒ frequency ⓓ quality

2 Photon energy = Planck's constant × .....

ⓐ photon frequency. ⓑ photon wavelength.

ⓒ amplitude. ⓓ photon velocity.

3 Light refraction is due to the difference in ..... through different media.

ⓐ sound intensity ⓑ nature of sound wave

ⓒ light velocity ⓓ sound velocity

4 Sound of frequency 200 Hz is ..... the sound of frequency 100 Hz.

ⓐ harsher than ⓑ sharper than

ⓒ low pitched than ⓓ rougher than

B What happens when ...? (2 marks)

Incidence of a white light ray on one face of a triangular glass prism.

.....

.....

Test 5

Total mark 10

Answer the following questions :

A Choose the correct answer : (8 marks)

1 The scientific term that expresses the strength and the weakness of sound is .....

ⓐ the frequency of sound. ⓑ the pitch of sound.

ⓒ the quality of sound. ⓓ the intensity of sound.

2 The ..... colour of the seven spectrum colours, has the lowest deviation.

ⓐ vilot ⓑ green

ⓒ red ⓓ yellow

3 The angle between the emergent light ray and the normal at the point of emergence on the interface, is called the angle of .....

ⓐ incidence. ⓑ reflection.

ⓒ refraction. ⓓ emergence.

4 All the following are factors affecting sound intensity, except .....

ⓐ The amplitude of the sound source.

ⓑ the medium density.

ⓒ the frequency of the sound wave.

ⓓ the wind direction.

B Give a reason for the following : (2 marks)

Light can travel through space.

.....

.....

Answers of Test 1

A 1 (a) 2 (c)
3 (a) 4 (c)

B Because dolphins produce ultrasonic waves, while the human ears can't hear sounds of frequencies more than 20 kilohertz.

Answers of Test 2

A 1 (b) 2 (d)
3 (c) 4 (b)

B Because the light of the Sun consists of seven colours which are called spectrum colours.

Answers of Test 3

A 1 (c) 2 (b)
3 (b) 4 (c)

B They are sound waves of frequencies lower than 20 Hz.

Answers of Test 4

A 1 (c) 2 (a)
3 (c) 4 (b)

B The white light ray is analyzed into seven colours.

Answers of Test 5

A 1 (d) 2 (c)
3 (d) 4 (c)

B Because it is an electromagnetic waves which do not need a medium to travel through.

April Tests

Model 1

Total mark: 10

Question 1 — 5 marks

A Choose the correct answer :

1. If the distance between a surface and light source decreases to its half, the light intensity of the surface .....

a. decreases to its one fourth.
b. decreases to its half.
c. increases twice.
d. increases four times.

2. The floral whorl, which is absent (not found) in the female flower is the .....

a. calyx.
b. corolla.
c. androecium.
d. gynoecium.

3. If the frequency of red colour is 4×10^{12} Hz, the frequency of violet colour is ..... $\times 10^{12}$ Hz.

a. 1.5
b. 3.5
c. 4
d. 7.5

4. If the angle between a reflected light ray and a reflecting surface is 30°, so the angle of reflection will be equal to .....

a. 15°
b. 30°
c. 60°
d. 90°

B What is meant by ...?

The velocity of light is 3×10^{8} m/sec.

.....

.....

.....

Question 2 5 marks

A Put (✓) or (✗) :

1. Auto (Self) pollination occurs in barely plant. ( )
2. Reflection of light from rough surfaces is called regular reflection. ( )
3. Vegetative reproduction is a kind of sexual reproduction. ( )
4. When light ray travels from air to water, the angle of incidence is greater than the angle of refraction. ( )

B Give a reason for the following :

The stigmas of air pollinated flowers are feathery like and sticky.

.....

.....

.....

Total mark
10

Model 2

Question 1 5 marks

A Choose from column (B) what suits it in column (A).

(A)	(B)
1. Androecium	a. is the change of the path of light ray when it moves between two media with different optical densities.
2. Light reflection	b. is the male organ in a flower.
3. Gynoecium	c. is the change in the direction of light ray in the same medium, when it falls on a reflecting surface.
4. Light refraction	d. protects the inner parts of a flower.
	e. is the female organ in a flower.

1. ..... 2. ..... 3. ..... 4. .....

B **What happens if ... ?**

A compact disc (CD) with shiny side is put to face sunlight.

.....

.....

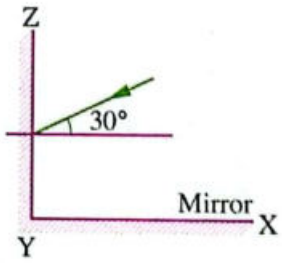
.....

Question 2 5 marks

A **Write the scientific term of each of the following :**

1. A physical quantity equals Plank's constant is multiplied by frequency. (.....)
2. A group of flowers found on the same axle. (.....)
3. The position, at which the submerged object in water is seen slightly above its real position. (.....)
4. The reproduction of some plants by parts of the roots, stems or leaves. (.....)

B **Complete the following figure after redrawing it in your answer sheet, then write the name of each ray :**



Model (1)

15 Marks

1 (A) Complete the following sentences:

1. The mechanical waves are classified into ..... and ..... waves.
2. The voice of a bird is ..... so, it is said that it has ..... pitched voice.
3. When turning Savart's Wheel with a speed of 60 rotations/sec. using a gear of 50 teeth, the frequency produced is ..... Hz.
4. The frequency of orange color is ..... than the frequency of yellow color.

(B) Give a reason for:

- The intensity of sound increases four times when the distance between the sound source and the ear decreases to its half value.
  - .....
  - .....

2 (A) Put (✓) or (✗):

1. The distance between the center of a compression and the center of a rarefaction represents half the wavelength. ( )
2. Harmonic tones are tones that accompany the fundamental tone but they are equal in intensity and pitch. ( )
3. The energy of photon is directly proportional to the intensity of light. ( )
4. Skin is a semi-transparent medium. ( )

(B) What happens when ...?

- Incidence of a white light ray on one face of a triangular glass prism.
  - .....

Model (2)

15 Marks

1 (A) Choose the correct answer:

1 ..... color has the lowest deviation.

a) Violet b) Green c) Red d) Yellow

2 ..... medium allows most of light to pass through it.

a) Transparent b) Semitransparent c) Translucent d) Opaque

3 All the following indicate the nature of sound waves except that ..... .

a) their velocity through air is 340 m/s.

b) they propagate as spheres of compression and rarefaction

c) they are mechanical waves

d) they are transverse waves

4 If the distance between the center of the third compression and the center of the fifth compression is 20 cm, then the wavelength of this wave equals ..... cm.

a) 15 b) 30 c) 10 d) 7.5

(B) Give a reason for:

- The energy of a red-light photon is less than that of any other light.

- .....

2 (A) Write the scientific term:

1 A quantity of light falling perpendicular to a unit area of a surface in one second. (.....)

2 It is an external factor that affects on the ear causing the sense of hearing. (.....)

3 Sound waves of frequencies less than 20 Hz. (.....)

4 The number of waves made by a source in one second. (.....)

(B) What happens when ...?

- Decreasing the amplitude of the sound source.

- .....

Model (3)

15 Marks

1 (A) Complete the following sentences:

1. If the distance between the center of the first compression and the center of the third compression of a longitudinal wave equals 30 cm, then its wavelength is ..... .
2. Sound ..... when the vibrating body stops its vibration.
3. Sound intensity is the property by which human ear can distinguish between ..... and ..... .
4. Light is a ..... wave that travels through vacuum.

(B) What is meant by...?

- The amplitude of a wave = 30 cm.
- .....
- .....

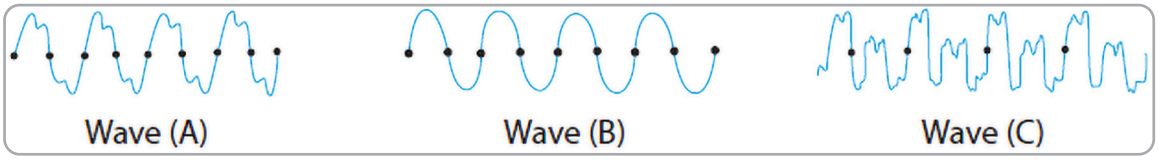
2 (A) Correct the underlined words:

1. Sound frequency increases by increasing its <u>roughness</u>. (.....)
2. The wavelength of green color is less than the wavelength of <u>blue</u>. (.....)
3. The speed of light is the distance covered by light in one <u>minute</u>. (.....)
4. Light intensity is <u>directly</u> proportional with the square of the distance. (.....)

(B) Look at the following figures, then answer:

- Which one of these waves represents the sound produced from?

(1) piano (2) violin (3) tuning fork



1- ..... 2- ..... 3- .....

Model (4)

15 Marks

1 (A) Choose the correct answer:

1. If the vertical distance between a crest and trough is 20 cm, then the amplitude of the wave equals ..... cm.

   a) 5 b) 10 c) 20 d) 50

2. Sound velocity is measured by ..... unit.

   a) meter b) Hertz c) second d) meter/second

3. When the distance between the sound source and the ear is doubled the sound intensity ..... .

   a) decreases to its half b) increases twice
   c) increases four times d) decreases to its quarter

4. All the following are from the properties of red color except ..... .

   a) it is the closest color to the prism apex b) it has the lowest deviation
   c) it has the shortest wavelength d) it has the lowest frequency

(B) Give a reason for:

- The waves produced due to vibration of a string are transverse mechanical waves.

  - .....
  - .....

2 (A) Write the scientific term:

1. The measuring unit of sound intensity. (.....)
2. Complicated light which consists of seven spectrum colors. (.....)
3. A structure used in the analysis of light. (.....)
4. They are simple pure tones which are produced when the tuning fork vibrates. (.....)

(B) Answer the following:

- Calculate the ratio between the frequency of two waves produced from Savart's Wheel during the same period if the number of the gear's teeth are 60, 100 teeth and the number of rotations are 80, 120 cycles.

  - .....
  - .....
  - .....

Model (5)

15 Marks

1 Put (✓) or (✗):

1. The wavelength of visible light ranges between 380:700 km. ( )
2. The ratio between frequencies of red and violet colors is less than one. ( )
3. Ultrasonic waves are used in sterilizing food substances. ( )
4. The frequency is the maximum displacement done by the particles of the medium. ( )

(B) Give a reason for:

- The travelling sound in air has less intensity than that travels in carbon dioxide gas.

- .....

2 (A) Complete the following sentences:

1. The medium that does not allow light to pass is called ..... .
2. Wood and ..... are examples of ..... .
3. The intensity of sound increases ..... when the distance between the sound source and the ear decreases to it is half value.
4. Voice pitch depends on ..... of sound source.

(B) Answer the following:

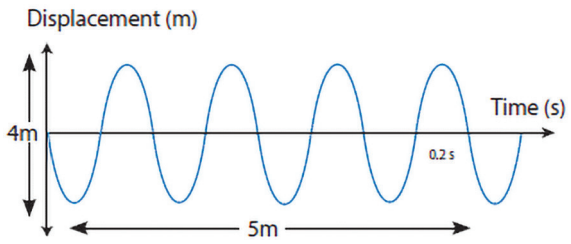
- In the opposite figure find:

a. The wavelength.

b. Frequency.

c. Amplitude.

d. The velocity of wave propagation.



- .....

- .....

- .....

- .....

Model (1)

15 Marks

1 (A) Complete the following sentences:

1. The mechanical waves are classified into transverse and longitudinal waves.
2. The voice of a bird is sharp so, it is said that it has high pitched voice.
3. When turning Savart's Wheel with a speed of 60 rotations/sec. using a gear of 50 teeth, the frequency produced is 3000 Hz.
4. The frequency of orange color is less than the frequency of yellow color.

(B) Give a reason for:

- The intensity of sound increases four times when the distance between the sound source and the ear decreases to its half value.

  Because sound intensity is inversely proportional to the square distance between the ear and the sound source.

2 (A) Put (✓) or (✗):

1. The distance between the center of a compression and the center of a rarefaction represents half the wavelength. (✓)
2. Harmonic tones are tones that accompany the fundamental tone but they are equal in intensity and pitch. (✗)
3. The energy of photon is directly proportional to the intensity of light. (✗)
4. Skin is a semi-transparent medium. (✗)

(B) What happens when ...?

- Incidence of a white light ray on one face of a triangular glass prism.

  It splits into seven colors.

Model (2)

15 Marks

1 (A) Choose the correct answer:

1. ..... color has the lowest deviation.

   a) Violet b) Green c) Red d) Yellow

2. ..... medium allows most of light to pass through it.

   a) Transparent b) Semitransparent c) Translucent d) Opaque

3. All the following indicate the nature of sound waves except that ..... .

   a) their velocity through air is 340 m/s.

   b) they propagate as spheres of compression and rarefaction

   c) they are mechanical waves

   d) they are transverse waves

4. If the distance between the center of the third compression and the center of the fifth compression is 20 cm, then the wavelength of this wave equals ..... cm.

   a) 15 b) 30 c) 10 d) 7.5

(B) Give a reason for:

- The energy of a red-light photon is less than that of any other light.

  Because it has the lowest frequency.

2 (A) Write the scientific term:

1. A quantity of light falling perpendicular to a unit area of a surface in one second. (Light intensity)
2. It is an external factor that affects on the ear causing the sense of hearing. (Sound)
3. Sound waves of frequencies less than 20 Hz. (Infrasonic waves)
4. The number of waves made by a source in one second. (Wave frequency)

(B) What happens when ...?

- Decreasing the amplitude of the sound source.

  The sound intensity will increase.

Model (3)

15 Marks

1 (A) Complete the following sentences:

1. If the distance between the center of the first compression and the center of the third compression of a longitudinal wave equals 30 cm, then its wavelength is 15 cm.
2. Sound stops when the vibrating body stops its vibration.
3. Sound intensity is the property by which human ear can distinguish between strong and weak.
4. Light is a transverse wave that travels through vacuum.

(B) What is meant by...?

- The amplitude of a wave = 30 cm.

It means that the maximum displacement done by particles of the medium from their rest positions = 30 cm.

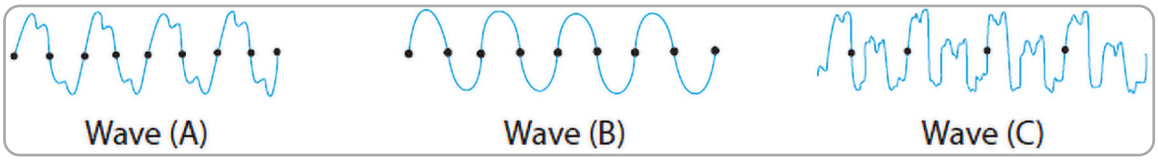
2 (A) Correct the underlined words:

1. Sound frequency increases by increasing its roughness. (sharpness)
2. The wavelength of green color is less than the wavelength of blue. (yellow)
3. The speed of light is the distance covered by light in one minute. (second)
4. Light intensity is directly proportional with the square of the distance. (inversely)

(B) Look at the following figures, then answer:

- Which one of these waves represents the sound produced from?

(1) piano (2) violin (3) tuning fork



1- Wave (A) 2- Wave (c) 3- Wave (B)

Model (4)

15 Marks

1 (A) Choose the correct answer:

1. If the vertical distance between a crest and trough is 20 cm, then the amplitude of the wave equals ..... cm.

   a) 5 b) 10 c) 20 d) 50

2. Sound velocity is measured by ..... unit.

   a) meter b) Hertz c) second d) meter/second

3. When the distance between the sound source and the ear is doubled the sound intensity ..... .

   a) decreases to its half b) increases twice
   c) increases four times d) decreases to its quarter

4. All the following are from the properties of red color except ..... .

   a) it is the closest color to the prism apex b) it has the lowest deviation
   c) it has the shortest wavelength d) it has the lowest frequency

(B) Give a reason for:

- The waves produced due to vibration of a string are transverse mechanical waves.

  Because it needs a medium to propagate through and medium particles vibrate perpendicularly to the direction of the wave propagation.

2 (A) Write the scientific term:

1. The measuring unit of sound intensity. (Watt/meter)
2. Complicated light which consists of seven spectrum colors. (White light)
3. A structure used in the analysis of light. (Prism)
4. They are simple pure tones which are produced when the tuning fork vibrates. (Fundamental tones)

(B) Answer the following:

- Calculate the ratio between the frequency of two waves produced from Savart's Wheel during the same period if the number of the gear's teeth are 60, 100 teeth and the number of rotations are 80, 120 cycles.

$$F1 = \frac{60 \times 80}{t} = \frac{4800}{t}$$

$$F2 = \frac{100 \times 120}{t} = \frac{12000}{t}$$

$$\frac{F1}{F2} = \frac{4800}{12000} = \frac{2}{5}$$

Model (5)

15 Marks

1 Put (✓) or (✗):

1. The wavelength of visible light ranges between 380:700 km. (✓)
2. The ratio between frequencies of red and violet colors is less than one. (✓)
3. Ultrasonic waves are used in sterilizing food substances. (✗)
4. The frequency is the maximum displacement done by the particles of the medium. (✗)

(B) Give a reason for:

- The travelling sound in air has less intensity than that travels in carbon dioxide gas.

Because the density of carbon dioxide gas is higher than the density of air.

2 (A) Complete the following sentences:

1. The medium that does not allow light to pass is called opaque.
2. Wood and carton are examples of opaque mediums.
3. The intensity of sound increases four times when the distance between the sound source and the ear decreases to it is half value.
4. Voice pitch depends on frequency of sound source.

(B) Answer the following:

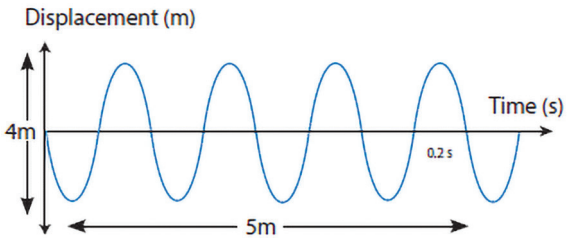
- In the opposite figure find:

a. The wavelength.

b. Frequency.

c. Amplitude.

d. The velocity of wave propagation.



a. The wavelength = 1.25 m.

b. Frequency = 2.5 Hz.

c. Amplitude = 2 m.

d. The velocity of wave propagation = 3.125 m/s.

Revision on lesson one

1. Choose the correct answer:

1. A sound travels in air with velocity 330metre/sec. and has a wavelength 0.1metre, its frequency equals……

a. 330Kilohartz b. 3300Hertz c.33Kilohertz d.330hertz

2. Sound of frequency 200Hz is …….. than the sound of frequency 100Hz.

a. stronger b. sharper c. weaker d. harsher

3. All of the following are factors affecting sound intensity, except the ……

a. amplitude of vibration b. medium density

c. frequency d. wind direction.

4. The human ear can distinguish sounds of frequency……

a. 50KHz b. 30KHz c.300Hz d.5 Hz.

---

2) Give Reason for:

1. Sound travelling in air has less intensity than that travelling in carbon dioxide.

……
……

2. The intensity of sound decrease as the amplitude of vibrating source decrease.

……
……..

3. We hear sound from all direction that surround the sound source.

……
……

---

3) Write the scientific term:

1. The measuring unit of sound intensity. ( )
2. The intensity of sound at a point varies inversely with the square of the distance between that point and sound source. ( )

---

4) Savart's wheel rotates with a rate of 300 cycles per minute. A sound of frequency 600Hz is peoduced when an elastic plate touches the teeth of one gear. Calculate the number of teeth of the gear.

Revision on lesson two

1)choose the correct answer:

1. Light waves are ……. Waves.

a. mechanical transverse **b. electromagnetic transverse**

c. electromagnetic longitudinal **d. mechanical longitudinal**

2. Photon energy = plank's constant * ……..

a. Photon frequency **b. photon wavelength**

c. amplitude. **d. photon velocity.**

3. The human skin is considered as a/an …… medium.

a. transparent **b. opaque** **c. transverse** **d. semi-transparent**

4. Light travels in …… lines.

a. curved **b. circular** **c. straight** **d. zigzag**

5. When the distance between the source of light and the surface of a wall decreases, the light intensity on the surface……..

a. decrease **b. increase** **c. is doubled** **d. remains constant**

---

2)Write the scientific term of each of following

1. **The main source of light energy on the Earth's surface.** **( )**
2. **A mixture of seven spectrum colours.** **( )**
3. **The colour which has the highest frequency, shortest wavelength** **( )**
4. **A medium doesn't allow light rays to penetrate through.** **( )**

Give reason for:

1. The energy of red light photon is less than that of orange light photon.

……

2. A clear glass is a transparent medium.

……

3. A tissue paper is a transparent medium.

……..

4. The in ability to see the impurities present in black honey

……

Revision on lesson three

Write the scientific term:

1. **The reflection in which the light rays recoil in many directions when falling on a rough surface. ( )**
2. **The angle between the reflected light ray and the normal at the point of incidence on the separating surface. ( )**
3. **The ability of the medium to refract light rays. ( )**
4. **Changing the path of light when it travels from a transparent medium to another transparent medium of different optical density. ( )**
5. **The ratio between the velocities of light through air to the velocity of light through transparent medium. ( )**

Complete the following:

1. **when a light ray travels from a transparent medium of higher optical density to another of lower density, the angle of…… is more than the angle of …….**
2. **Light …… is the change of light path when it travels from a transparent medium to another one of different……**

Give reason for:

1. **The light that falls perpendicular on a glistening surface reflects on itself.**

…….

2. **When the light ray travels from air to water it refracts near to the normal.**

……..

3. **Occurrence of mirage phenomenon in desert regions at noon.**

…….

What happen if..?

1. **Alight ray falls perpendicular to the interface between two transparent media of different optical densities.**

……

Problems:

1. **if the angle between the incident light ray and the reflected light ray is 140^{o}, find the angle of incidence and the angle of reflection.**

……

2. **calculate the absolute refractive index of diamond given that the speed of light through it is 1.25×10^{8}m/s.(knowing that the velocity of light through air is 3×10^{8}m/s**

Revision on unit two

1) write the scientific term:

1. Sound waves of frequencies less than 20Hz. ( )
2. A medium does not allow light rays to penetrate throw. ( )
3. Changing the path of light when travel from a transparent medium to another transparent medium of different optical density. ( )

2) choose the correct answer:

1. Sound of frequency 200Hz is …….. than sound of frequency 100Hz.

a. sharper b. stronger c. harsher d. weaker

2. When the distance between the source of light and the surface as a wall decreases , the light intensity on the surface…….

a. decrease b. increase c. doubled d. remains constant

3) write down the mathematical relation that joins between each of the following:

1. The photon frequency and its energy.

……

2. The sound frequency (F), the number of teeth of each of the gear in savart's wheel (n).

……..

4) what are the results due to each of the following…?

1. Incidence of light rays on a rough surface.

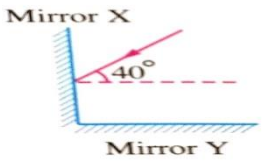
……

2. Incidence of a white light ray on one face of a triangular glass prism.

……

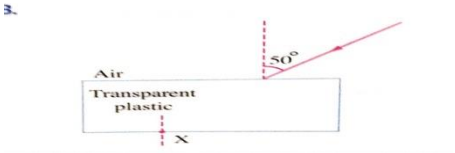
5) complete the path of rays in each of the following figures according to what is written below each:

A)



Determination of the angle of reflection of the ray on mirror (Y)

B)



calculate the angle of emergence from point (X)

Worksheet

Q.(1): Give reasons:

1. The ultrasonic waves are used in milk sterilization?
2. The piano sound differs from the violin sound even if they have the same pitch and intensity?
3. Sound traveling in air has less intensity than that traveling in carbon dioxide?

Q.(2): What's meant by:

1. The wavelength of a sound wave is 1.5 m?
2. Sound intensity?
3. Sound quality?

Q.(3): Answer the following question:

1. Savart's wheel rotate with a rate 300 cycles per minute. A sound with frequency 600 Hz is produced when an elastic plate touches the teeth of the gear. Calculate the number of the teeth of the gear?
2. Calculate the number of teeth of savart's wheel, given that the frequency of the sound produced is 100 Hz and the wheel rotates 30 cycles/min?
3. A sound source produces 3600 cycles in 3 minutes. If its wavelength is 17 meters. Find the velocity of the sound wave?

You can if you think that you can

Believe in yourself ❤

Worksheet 4

1-Complete the following statement:

1-Light is.....waves that travel through free space.

2-Light travels through the ..... Media in.....lines.

3-The light velocity is the distance .....

4-Light waves consists of ..... and.....

5-The light intensity is the amount of light .....

2-Give reason for:

1-formation of spectrum colors?

2-A clear glass is a transparent medium?

3-The light of the sun is complex light?

4-Light can travel through free space?

5-wood is opaque medium?

Dream it! Wish it! Do it! ❤

Worksheet 5

Q.(1) Answer the following questions:

1. **Calculate the absolute refractive index of diamond given that the speed of light through it 1.25 X 10^8 m/s, and the velocity of light in air is 3 X 10^8 m/s?**
2. **Calculate the velocity of light in glass if the velocity of light in air is 3 X 10^8 m/s and the refractive index of glass is 1.5?**

Q.(2): Give reasons:

1. **The absolute refractive index of any transparent media is greater than 1?**
2. **The floor of the swimming pool appears higher than its original position?**

3-when a light ray passes through a glass prism, it refracts?

Q.(3): Define:

1-Angle of refraction.

2-Mirage phenomenon.

3-Light refraction.

Everything is possible ❤

March Revision

Mr. Ahmed ElBasha

(1) Write the scientific term:

1	The distance covered by the wave in one second.	(.....)
2	Non-audible waves whose frequencies are less than 20 Hz.	(.....)
3	The measuring unit of noise intensity.	(.....)
4	The ability of the medium to refract light.	(.....)
5	It is an external stimulus that affects the ear and causes hearing.	(.....)
6	A tool is used to determine the pitch of an unknown tone.	(.....)
7	The amount of light that falling perpendicular to a unit area of a surface in one second.	(.....)
8	The measuring unit of sound intensity	(.....)
9	The angle between the emergent light ray and the normal.	(.....)
10	Angle of incidence= Angle of reflection	(.....)
11	A property by which the human ear can distinguish between strong and weak sounds.	(.....)
12	Rebounding of light waves in the same medium due to meeting a reflecting surface.	(.....)
13	An angle between the incident light ray and the normal at the point of incidence on the interface.	(.....)
14	Bodies don't allow the passage of light through them.	(.....)
15	Waves of frequencies ranging from 20 Hz to 20000 Hz.	(.....)
16	The scientist who discovered that the energy of photon depends on its frequency.	(.....)

17	The distance that a wave travels in one second.	(.....)
18	The product of Planck's constant times the frequency of photon.	(.....)
19	The waves which need a medium to propagate.	(.....)
20	The reflection in which the light rays recoil in many directions, when falling on a rough surface.	(.....)
21	A phenomenon that appears in the desert as a result of reflection and refraction of light.	(.....)
22	The property by which the ears can distinguish between sounds with respect to the nature of the source even if they are equal in pitch and intensity.	(.....)
23	The angel between the reflected ray and the normal at the incidence point on the reflecting surface.	(.....)
24	The ability of the medium to refract light rays.	(.....)
25	Sound waves their frequency is more than 20000 Hz.	(.....)

✹(2) Choose the right answer:

1. All the following are from the factors affecting sound intensity except the .....
a. amplitude. b. frequency. c. density of medium. d. wind direction.

2. The quantum of energy of green light is ..... the quantum of energy of yellow light.
a. greater than b. equal to c. less than d. no correct answer

3. Sound of frequency 200 Hz is ..... than the sound of frequency 100 Hz.
a. sharper b. stronger c. harsher d. weaker

4. The absolute refractive index of water is .....
a. 0.5 b. 0.8 c. 0.33 d. 1.33

5. When the incident light ray reflects on itself, the angle of incidence equals .....
a. 0° b. 90° c. 120° d. 180°

6. The human ear can distinguish sounds of frequency .....
a. 50 KHz. b. 30 KHz. c. 300 KHz. d. 50 Hz.

7. The ..... color light in the spectrum colours has the highest deviation.
a. white b. red c. violet d. yellow

8. The photon energy= Plank's constant x .....
a. wavelength. b. velocity. c. amplitude. d. frequency.

9. The sound of frequency 500 Hz is ..... than the sound of frequency 100 Hz.
a. stronger b. sharper c. weaker d. harsher

10. The angle of incidence of light is ..... its angle of reflection.
a. larger than b. smaller than c. equal to d. no correct answer

11. If the angle between the incident light ray and the reflected light ray is 30° so, the angle of reflection is .....
a. 30 b. 15 c. 60 d. 40

12. All of the following are factors affecting sound intensity except .....
a. amplitude of vibration. b. frequency.
c. medium density. d. wind direction.

13. The submerged object in water as a fish is seen in an apparent position slightly above its real position due to ..... of the light rays.
a. refraction b. reflection c. analysis d. total internal reflection

14. White light analyzes into ..... spectrum colours.
a. 3 b. 5 c. 7 d. 9

15. The doctors use waves with a frequency ..... to break down kidney stones.
a. less than 20 Hz b. 20 Hz c. more than 20 KHz

16. The absolute refractive index of any material is always ..... one.

a. less than b. more than c. equal

17. In ..... reflection, the reflected rays are reflected in many directions.

a. uniform b. irregular c. both (a) and (b)

18. All of these sounds are of uniform frequency except the sound of .....

a. piano. b. violin. c. loudspeakers. d. guitar.

19. The quantum of energy of green light is ..... the quantum of energy of yellow light.

a. greater than b. equal to c. smaller than d. no correct answer

20. ..... media do not allow light to pass through it.

a. Transparent b. Translucent c. Opaque d. no correct answer

21. If the angle between the incident light ray and the reflected light ray is 90°, so the angle of reflection will be equal .....

a. 0° b. 30° c.45° d. 90°

22. Doctors use waves of a frequency ..... to break down kidney and ureter stones.

a. more than 20 Hz b. less than 20 KHz

c. 20 Hz d. more than 20 KHz

23. The human skin is considered as a/an ..... medium.

a. transparent b. opaque c. translucent d. no correct answer

24. A pencil seems broken when it is placed in a glass cup of water due to ..... of light.

a. critical angle b. mirage c. refraction d. reflection

25. A natural phenomenon takes place on the desert roads at noon due to reflection and refraction of the light .....

a. lightning. b. thunder. c. mirage. d. rainbow.

26. The measuring unit of noise intensity is .....

a. Hertz. b. Watt/m^2 . c. Cycles/sec. d. Decibel.

27. We can hear all of the following sounds except .....

a. 40 Hz. b. 60 KHz. c. 10 KHz. d. 60 Hz.

28. Sound of different musical instruments can be differentiated from each other by .....

a. harmonic tones. b. fundamental tone.

c. sound intensity. d. sound pitch.

✹(3) Complete the following :

1. Light is ..... waves but sound is ..... waves.
2. ..... is a transparent medium of light but wood is a(an) ..... medium.
3. Sharp tones have ..... frequencies, while rough tones have ..... frequencies.
4. Harmonic tones are lower in ..... and higher in ..... than fundamental tones.
5. The measuring unit of noise intensity is ....., while the measuring unit of the periodic time is .....
6. When light travels from a medium of ..... optical density to another of ..... optical density, it refracts far from the normal line.
7. The reflection of light is classified into two types which are ..... and .....
8. The frequency of sonic waves ranges between ..... Hz to ..... KHz.
9. The voice of women is ..... pitched, while the voice of men is ..... pitched.
10. Waves are classified according to the ability to propagate and transfer energy into ..... and ..... waves.
11. Max Planck proved that the energy of light wave consists of energy quanta known as .....
12. The glass prism is used to analyses the ..... light into ..... colors.
13. As the amplitude increases, the sound intensity .....
14. Infrasonic waves are sound waves of frequencies less than ..... Hz.
15. When a light ray falls perpendicular on a reflecting surface the angle of reflection equals .....
16. ..... color has the longest wavelength, while ..... has the shortest wavelength.
17. When you look at a coin in a glass of water, its ..... position appears to be lower than the ..... position.
18. Sounds can be classified into two groups, musical tones of ..... frequency and noises of ..... frequency.
19. The human skin is considered ..... medium, while pure glass is ..... medium for light.
20. The Sound if from ..... waves that can't travel through.....
21. The high-pitched sound waves have high ..... and small .....

22. The light velocity is the distance .....

23. Light travels through the ..... media in ..... lines.

24. From properties of light is that light travels in ..... lines.

25. The angle of incidence ..... the angle of reflection.

26. The sound intensity at a point is ..... proportional to the square of the distance between this and the source of sound.

27. Sound is produced from ..... of bodies.

28. If the angle between the incident light ray and reflected light ray is 100° , so the angle of reflection = ...

29. In ..... reflection, rays are reflected in one direction.

✹(4) Correct the underlined words:

1	Sound pitch is increased by **decreasing** the frequency.	(.....)
2	Light propagates in **zigzag** lines.	(.....)
3	The angle between the incident light ray and the reflected light ray = 100°, so the angle of reflection = **60°**	(.....)
4	The human skin is considered as **translucent** medium.	(.....)
5	We see the submerged objects in water in a **lower** position than its real position	(.....)
6	Changing the light ray path when it faces a transparent object is considered **light reflection**	(.....)
7	The absolute refractive index of any material is always **smaller than one**	(.....)
8	**Yellow** colour is the first colour in spectrum colours.	(.....)
9	**Sonic** waves are used in sterilization of milk.	(.....)
10	Frequency of infrasonic waves is less than **2000** Hz.	(.....)
11	Human ear can distinguish between sound of frequencies ranging between **10** : 20000 Hz.	(.....)
12	The angle of incident of a light ray is **greater than** the angle of reflection.	(.....)
13	The produced tone from a tuning fork is called **complicated tone**	(.....)
14	**Rainbow** phenomenon takes place on desert roads at noon specially in summer.	(.....)
15	The **infrasonic** waves are used in breaking down kidney stones.	(.....)
16	As the density of medium decreases, **amplitude increases.**	(.....)
17	Unit of sound intensity is **Hertz**.	(.....)
18	Harmonic tones companying the fundamental tone lower in **pitch**.	(.....)
19	Light **refraction** is rebounding of light wave in the same medium.	(.....)

✹(5) Give reason for:

1. **The pen seems broken when it is put in a glass of water.**

   .....

2. **The use of ultrasonic waves in milk sterilization**

   .....

3. **Wood doesn't allow the passage of light through it.**

   .....

4. **When a light ray is incident perpendicular to the reflecting surface, it reflects on itself.**

   .....

5. **The energy of red light photon is less than the energy of violet light photon.**

   .....

6. **Sound travelling in air has less intensity than that travelling in carbon dioxide.**

   .....

7. **Occurrence of mirage phenomenon in desert region at noon.**

   .....

8. **Light can travel through free space.**

   .....

9. **Clear glass is a transparent medium.**

   .....

10. **We see lightning before hearing thunder.**

    .....

11. **The fish in water is seen in an apparent position slightly above its real position.**

    .....

✹(6) What happen if:

1. **Decreasing the amplitude of the sound source to its half (concerning the sound intensity).**

   .....

2. **Incidence of a white light ray on one face of a triangular glass prism.**

   .....

3. **When the distance between the light source and a surface is doubled (concerning the light intensity).**

   .....

4. **When you put a ringing mobile phone on a resonance box (concerning the sound intensity).**

   .....

5. **Incidence of light rays on a rough surface.**

   .....

6. **A light ray falls perpendicular on a reflecting surface.**

   .....

✹(7) Put (√) or (X) :

1. The fish is seen higher than its real position in the fish tank. ( )
2. The sound intensity decreases, when the source of sound touches an empty box. ( )
3. Infrasonic waves are used in breaking down stones of kidney. ( )
4. Harmonic tones that accompany the fundamental tone are lower in pitch. ( )
5. The measuring unit of sound intensity is decibel. ( )
6. The energy of light = Constant x Wavelength. ( )
7. The sound intensity deceases when it touches a resonance box ( )
8. Light waves are electromagnetic transverse wave. ( )
9. Sound intensity increase as amplitude increase. ( )
10. Sound can be heard from all directions that surround the sound source ( )
11. Sound intensity increases when wind and sound waves are in the same direction ( )
12. The absolute refractive index for any transparent medium is less than 1 ( )
13. The transverse wave consists of compressions and troughs. ( )

✹(8) Problems

1

Calculate the frequency of a musical tone similar to the tone produced from Savart's wheel rotating with a velocity of 960 cycles in two minutes, knowing that the number of gear teeth= 30 teeth.

.....

.....

.....

2

Calculate the speed of light through diamond given that the absolute refractive index of it = 2.4 and the speed of light through air = 3 x 10^8 *m/s.*

.....

.....

.....

3

savart's wheel rotates with a rate of 300 cycles per minute. A sound of frequency 600 Hz is produced when an elastic plate touches the teeth of the gear, calculate the number of teeth of the gear.

.....

.....

.....

4

Calculate the number of gear teeth of Savart's wheel, if a musical tone similar to the frequency of an emitted tone = 160 Hz, and Savart's wheel rotated with a velocity of 960 cycles in three minutes.

.....

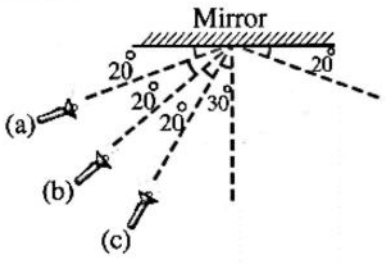
.....

.....

5

The opposite figure represents a torch emits light falls on a mirror :

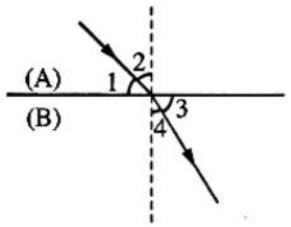
1. Torch ..... represents the following reflection.
2. The angle between the reflected light ray and its incident light ray = ...
3. Identify the second law of reflection of light.



.....

6

From the opposite figure, find the number that refers to the following :



1. The angle of incidence.
2. The angle of refraction.
3. Which medium (A) or (B) is greater in the optical density ?

.....

.....

7

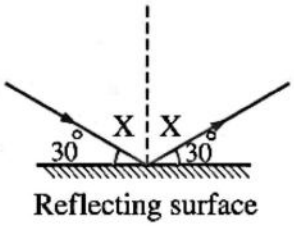
Complete the opposite figures after redrawing them in your answer sheet then complete the following statements :

Fig. (1) Fig. (2)

1. In fig. (1) the angle of reflection = ...
2. In fig. (2) the angle of incidence = ...

8

From the opposite figure :



1. Calculate the angles of incidence and reflection.
2. What can you conclude from this figure ?
3. What will happen if this light ray falls perpendicular on the reflecting surface ?

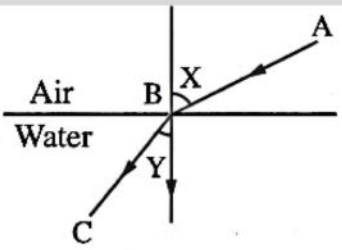
.....

.....

.....

9

From the opposite figure, answer :



1. The ray (AB) represents .....
2. The ray (BC) represents .....
3. Angle (X) is .....
4. Angle (Y) is .....

Model Answer

✹ (1) Write the scientific term:

1. Wave velocity
2. Infrasonic waves
3. Decibel
4. Optical density of medium
5. Sound
6. Savart wheel
7. Light intensity
8. Watt/m^2
9. Angle of emergence
10. First law
11. Sound intensity
12. Light reflection
13. Angle of incidence
14. Opaque object
15. Sonic waves
16. Max blank
17. Wave velocity
18. Photon energy
19. Mechanical waves
20. Irregular reflection
21. Mirage
22. Sound quality
23. Angle of reflection
24. Optical density of medium
25. Ultrasonic waves

✹(2) Choose the right answer:

1. B	6. D	11. B	16. B	21. C	26. D
2. A	7. C	12. B	17. B	22. B	27. B
3. A	8. D	13. A	18. C	23. B	28. A
4. D	9. B	14. C	19. A	24. C	
5. A	10. C	15. C	20. C	25. C	

✹(3) Complete the following:

1. Electromagnetic – mechanical
2. Glass opaque
3. High – low
4. Intensity – pitch
5. Decibel
6. Higher – lower
7. Regular – irregular
8. 20 – 20
9. High – low
10. Electromagnetic – mechanical
11. Photons
12. White – seven
13. Increase
14. 20
15. Zero
16. Red – violet
17. Real – apparent
18. Uniform – non uniform
19. Opaque – transparent
20. Mechanical – vacuum
21. Frequency – amplitude
22. Covered by light in one second
23. Transparent – straight
24. Straight
25. Equals
26. Inversely
27. Vibration
28. 50
29. Regular

✹(4) Correct the underlined words:

1. Increase
2. Straight
3. 50
4. Opaque
5. Higher
6. Light refraction
7. More
8. Red
9. Ultrasonic
10. 20
11. 20
12. Equal
13. Fundamental
14. Mirage
15. Ultrasonic
16. Intensity decrease
17. Watt/m^2
18. Intensity
19. Reflection

✹(5) Give reason for:

1. Due to the refraction of light rays coming from the immersed part in water , where the eye sees the immersed part of the pencil on the extensions of these refracted rays.
2. Because they have high ability to kill some types of bacteria and stop the action of some viruses.
3. Because it is an opaque medium.
4. Because angle of incidence= angle of reflection= zero.
5. Because the frequency of red light photon is less than that of orange light photon.
6. Because the density of carbon dioxide gas is more than that of air, since sound intensity is directly proportional to the density of the medium.
7. Due to reflection and refraction of light in air layers which differ in the degree of temperate
8. Because it is electromagnetic waves which don't need a medium to travel through.
9. Because clear glass permits most light to pass through and objects can be seen clearly through it.
10. Because the velocity of light waves of lightning (electromagnetic waves) is much greater than that of sound waves of thunder (mechanical waves).
11. Due to the refraction of light rays coming from the submerged object (far from the normal) where the eye sees the submerged object on the extensions of the refracted rays

✹(6) What happen if:

1. Sound intensity will decrease
2. The white light analysis into seven colours.
3. The light intensity decreases to its quarter.
4. The intensity of the produced tone increases.
5. The light rays are reflected in many directions.
6. The light ray will reflect on itself

✹ (7) Put (√) or (X) :

1. (√)	4. (X)	7. (X)	10. (√)	13. (X)
2. (X)	5. (X)	8. (√)	11. (√)	
3. (X)	6. (X)	9. (√)	12. (X)	

✹ (8) Problems:

1

Sound frequency (F)

$$= \frac{\text{Number of cycles (d)} \times \text{Number of gear teeth (n)}}{\text{Time in seconds (t)}}$$

$$= \frac{960 \times 30}{120} = 240 \text{ Hz.}$$

2

The absolute refractive index of diamond

$$= \frac{\text{Velocity of light through air}}{\text{Velocity of light through diamond}}$$

$$2.4 = \frac{3 \times 10^8}{\text{Velocity of light through diamond}}$$

Velocity of light through diamond

$$= \frac{3 \times 10^8}{2.4} = 1.25 \times 10^8 \text{ m/sec.}$$

3

Sound frequency (F) =

$$\frac{\text{Number of cycles (d)} \times \text{Number of gear teeth (n)}}{\text{Time in seconds (t)}}$$

$$600 = \frac{300 \times \text{Number of gear teeth}}{60}$$

$$\text{Number of gear teeth} = \frac{600 \times 60}{300} = 120 \text{ teeth.}$$

4

Sound frequency (F) =

$$\frac{\text{Number of cycles (d)} \times \text{Number of gear teeth (n)}}{\text{Time in seconds (t)}}$$

$$160 = \frac{960 \times \text{Number of gear teeth}}{180}$$

$$\text{Number of gear teeth} = \frac{160 \times 180}{960} = 30 \text{ teeth.}$$

5

1. (a) 2. 140°

3. The incident light ray, the reflected light ray and the normal to the surface of reflection at the point of incidence, all locate in one plane perpendicular to the reflecting surface.

6

1. 2 2. 4 3. Medium (B).

7

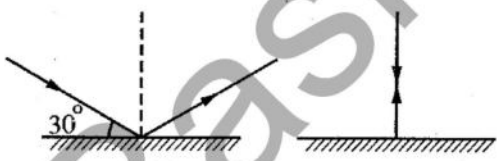


Fig. (1) Fig. (2)

1. 60° 2. zero

8

1. Angle of incidence = 90° – 30° = 60°
   Angle of reflection = 90° – 30° = 60°
2. Angle of incidence = Angle of reflection
3. It will reflect on itself.

9

1. incident ray. 2. refracted ray.
3. angle of incidence.
4. angle of refraction.

Write the scientific term:

1) It is the distance which is covered by the sound waves in one second.
( )

2) It is a property by which the ear can distinguish between rough and sharp voices ( )

3) It is the property by which the ear can distinguish between sounds either strong or weak. ( )

4) The intensity of sound at a point varies inversely with the square of the distance between that point and the sound source. ( )

5) It's the property by which the human ear can distinguish between different sounds according to the nature of source even if they are equal in intensity and pitch. ( )

6) They are sound waves of frequencies ranging from 20 Hz to 20 KHz.
( )

7) They are sound waves of frequency less than 20 Hz.
( )

8) They are sound waves of frequencies higher than 20 KHz.
( )

9) They are tones that accompany the basic tone, but they are lower in intensity and higher in pitch and differ from one instrument to another.
( )

10) It is the return of sound waves in the same direction due to hitting a reflecting surface. (

11) The angle of incidence = the angle of reflection. ( )

12) The incident sound ray, the reflected sound ray and the perpendicular line from the point of incidence on the reflecting surface all lie on the same plane, perpendicular to the reflecting surface ( )

13) It is the direction of the line of propagation of sound wave. ( )

14) It is the angle between the incident ray and the perpendicular to the reflecting surface at the point of incidence. ( )

15) It is the angle between the reflected sound ray and the perpendicular to the reflecting surface at the point of incidence. ( )

16) It is a repetition of sound produced due to its reflection. ( )

17) It is the collection of sound at a point due to its reflection on a concave surface. ( )

(1) Give reason for:

1- We hear sound from all directions that surround the sound source.

……

……

2- Sound intensity increases when the sound source touches a resonance box.

……

……

3- The human ear distinguishes between sounds from different sources even if they are equal in intensity and pitch.

……

……

4- Dogs can hear all sounds produced by man.

……
……

5- Man can't hear sounds produced by dolphins.

……
……
……

6- When a sound ray is incident perpendicular to a reflecting surface, it reflects on itself.

……
……

7- The voice of Imam can be heard clearly in all parts of large mosques without using microphones.

……
……

8- Fennec fox has large ability of hearing.

……
……

9- The ultrasonic waves can be used in detecting the industrial defects.

……
……

10- Bats can fly in the dark without colliding with any object.

……
……

11- Ultrasonic waves are used to sterilize food and water.

……
……

12- The ultrasonic waves have medical uses.

……

(2) Complete the following:

1- The voice of women is .....pitched as it is .....

2- The voice of men is ..... pitched as it is .....

3- As the sharpness of voice ....., the level of voice (pitch) gets...

4- The measuring unit of sound intensity is .....

5- Noise intensity is measured in unit known as .....

6- The angle of ..... = the angle of reflection.

7- The human ear cannot distinguish between two successive sounds if the period between them is less than .....

(3) Problem:

1) Calculate the wave length of a sound wave propagating through sea water with velocity 1500 m/sec knowing that its frequency is 1000 hertz.

.....

.....

2) Calculate the number of gear's teeth, if the wheel rotates with speed 180 cycles / minute and the frequency in Savart's wheel is 120 Hz.

.....

.....

3) A person stood at a distance of 660 meters from a mountain and produced a sound. He heard the echo after 4 sec. calculate the velocity of sound at that time.

.....

4) A sailor produced a sound in sea, he heard its echo after 0.6 second. If the velocity of sound through water is 1435 m/sec. Calculate the depth of sea.

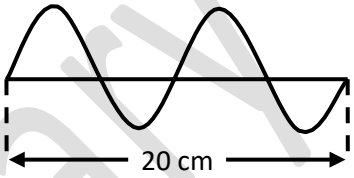
.....

5) Find the number of rotations in 2 minutes made by Savart's wheel producing sound of frequency 300 Hz, if a metallic plate touches one gear of 100 teeth.

…….

…….

6) From the opposite figure, calculate the velocity of the wave if its frequency is 25 Hertz.



…….

…….

…….

Lesson 1 Exam .1

1-Choose the correct answer:

1- All of these sounds are of uniform frequency, except the sound of .....
a. violin. b. guitar. c. loudspeakers. d. piano.

2- Sound waves do not travel through .....
a. water. b. air. c. vacuum. d. wood.

3- All of the following are factors affecting sound intensity, except the .....
a. amplitude of vibration. c. medium density.
b. frequency. d. wind direction.

4- The intensity of sound weakens as we go away from its source, because.....
a. $I \propto \frac{1}{d}$ b. $I \propto d$ c. $I \propto \frac{1}{d^2}$ d. $I \propto d^2$

5- A sound wave of frequency 30000 cycle/sec. is called ..... Wave.
a. sonic b. infrasonic c. ultrasonic d. radio

Put (√) or (X) and correct the wrong ones:

1- Sonic waves are used in sterilizing food substances. ( )
2- The ear can distinguish between sounds of different sources of the same frequency and intensity by their fundamental tones. ( )
3- The sound intensity decreases, when the source of sound touches an empty box. ( )

Complete the following statements:

1- Sound of a lion is ..... so it is said that he has ..... pitched sound.
2- When the distance between the sound source and the car ..... two times, the sound intensity decreases to its.....

Give reasons for :

1- Sound can be heard from all surrounding directions.

Mention the relationship between each of the following:

The sound intensity and the amplitude of the vibration of the sound source.

Exam (2) Lesson 1

Choose the correct answer:

1- Sounds of different musical instruments can be differentiated from each other by .....

a. frequency. c. harmonic tones.

b. fundamental tone. d. sound intensity.

2- The frequency of sound produced from a plate touching a gear of 20 teeth in Savart's wheel when the wheel rotates 300 cycle/minute equals..... Hz.

a. 300 b. 15 c. 6000 d. 100

3- Sound of frequency 200 Hz is .....than the sound of frequency 100 Hz.

a. stronger b. sharper c. weaker d. harsher

4- ..... waves can be heard by human ears.

a. Infrasonic b. Ultrasonic c. Sonic d. Ultraviolet

Write the scientific term of each of the following:

1- The measuring unit of the sound intensity.

2- Sound waves of frequencies less than 20 Hertz.

3- An instrument used to determine the frequency of unknown sound tone.

4- The property by which the human ears can distinguish between sounds from different sources even if they are equal in intensity and pitch.

5- The external factor which affects the ears causing the sense of hearing.

Give reasons for :

1- It is preferred to sit in the first rows more than sit in the back rows in lecture classes……

2- Man can't hear all sounds produced by dolphins.

……..

3- The importance of ultrasonic waves.

……

Lesson 2 Exam

Choose the correct answer:

1- The ……..colour in the spectrum colours has the highest frequency.

a. Violet b. green c. red d. yellow

2- If the distance between a surface and light source decrease to its half, the light intensity of the surface……..

a. Decrease to its half c. decrease to its one fourth

b. Increase twice d. increase four times

Write the scientific term of each of the following:

1- The media allow the passage of most light through them.
2- The amount of light falling perpendicular to a unit area of a surface in sec
3- A structure used in the analysis of light.
4- The colour which has the lowest deviation , closest to the prism apex.

Complete the following statements:

1- The light velocity is the distance……..
2- Light waves consist of……..and……..
3- Light travels through……..media in……lines.
4- By increasing the……..of transparent media, the quantity of light that pass through it……..

Give reasons for :

1- The inability to see the impurities present in black honey.
2- The light of the sun is a complex light.

What happens when ...?

1- Light falls on an opaque medium.

Exam (1)- Lesson 3

Choose the correct answer:

1- If the angle between a reflected light and a reflecting surface is 30, so the angle of reflection will be equal to……

a. 15 b. 30 c. 60 d. 90

2- The angle of incidence is smaller than the angle of refraction when a light ray travels from……

a. Air to water c. air to glass

b. Water to air d. water to glass

3- The ability of transparent medium to refract the light is called the…….of the medium.

a. Refractive index b. density c. optical density d. viscousty

Write the scientific term of each of the following:

1- The angle between the emergent light ray and the normal at the point of emergence on the interface.

2- The ratio between the velocity of light through air to the velocity of light through another transparent medium.

3- A narrow light beam, which is represented by a straight line that is reflected from the reflecting surface at the point of incidence.

4- Angle of incidence = Angle of reflection

Complete the following statements:

1- The light reflection is classified into two types which are……..and……

2- ……is a natural phenomenon that takes place on desert roads at noon in summer days due to light refraction and reflection.

Give reasons for :

1- The light ray that falls perpendicular on a glistening surface reflects on itself
2- The absolute refractive index of any transparent medium is always greater than one.

What happens when ...? You look from one side at a coin in a glass full of water.

Exam 2 - Lesson 3

Choose the correct answer:

1- If the angle between the incident light ray and reflected light ray is 90, so the angle of incidence equal……
a. 0 b. 30 c. 45 d. 90
2- A regular reflection happens when light rays falls on ……..
a. A woolen jacket c. stainless steel sheet
b. A leaf of a tree d. a piece of leather

Put (√) or (X) and correct the wrong ones:

1- The fish is seen higher than its real position in the fish tank. ( )
2- The reason of light refraction is that its velocity is equal in the different transparent media. ( )
3- The ability of transparent medium to refract light is called the refractive index of the medium. ( )
4- In uniform reflection, the light rays are reflected directly in one direction.

Complete the following statements:

1- The angle of……..is the angle between the incident ray and line perpendicular to the reflecting surface at the point of…….
2- The…….and the thin aluminium sheet are examples of smooth surfaces which cause……reflection.

Give reasons for :

1- The floor of the swimming pool appears higher than its real position.
……..
2- The light refracts when it travels from medium to another.
……

What happens when ...?

1- Light ray travel from air to glass.
……
2- Light ray falls perpendicular on a reflecting surface.

What is meant by:

1- Absolute refractive index of water is 1.33
……

2-The angle of emergence of light ray = 30

……

(1) Write the scientific term:

1) Sound velocity
2) Sound pitch
3) Sound intensity
4) Inverse square law of sound
5) Sound quality (type)
6) Sonic waves
7) Infra sonic waves
8) Ultrasonic waves
9) Harmonic tones
10) Sound reflection
11) First law of sound reflection
12) Second law of sound reflection
13) Sound ray
14) Angle of incidence of sound ray
15) Angle of reflection
16) Echo
17) Concentration of sound

(2) Give reason for:

1- Because the sound travels through air as pulses of compressions and rarefactions whose center is the sound source.
2- Due to the increase of the surface area of vibrating body..
3- Due to the harmonic tones that associate the fundamental tone of the source of sound and are lower in intensity and higher in pitch.
4- Because man produces sounds of frequencies less than 20 kilo Hertz and dogs can hear sounds up to 50 kilo Hertz.
5- Because dolphins produce sounds up to 120 kilo hertz, while man can hear sounds of frequencies up to 20 kilo hertz only.
6- Because the angle of incidence = the angle of reflection = zero.
7- Because the surface of large mosques are concave which concentrate the

reflected sound waves and make the sound more clear and more intense.

8- Because it has large and concave ear pinna that concentrates the reflected sound and make it more clear and more intense.

9- Because the waves reflected from the areas which contain air bubble have a different intensity than those reflected from well welded areas.

10- Because they produce ultrasonic waves that reflect on the surface and barriers then receive them back and locate their positions, thus the avoid colliding with them.

11- Because they have high ability to kill some types of bacteria and stop the action of some viruses.

12- Because they are used for breaking down of kidney and ureter's stones and also for diagnosis of male prostate tumors.

(3) Complete the following:

1- high - sharp. 2- low - rough.

3- increase - higher. 4- watt /m^2

1- decibel. 6- incidence 7- 0.1 sec

(4) Problem:

1) Velocity (v) = frequency (f) × wave length (λ)

∴ wave length = 1500/1000 = 1.5 m

2) F = 120 Hz

Speed of rotation = 180 cycles\minute

Time = 1 minute = 1 × 60 = 60 sec

∴ Frequency (f) = $\frac{\text{No of cycles}}{\text{Time}}$ × number of gear's teeth (n)

120 = $\frac{180}{60}$ × no of gear's teeth (n)

∴ Number of gear's teeth = $\frac{60\times120}{180}$ = 40 teeth

3) v = (2 × d) / t

= (2 × 660) / 4 = 330 m/s

4) d = (v × t) / 2

= (1435 × 0.6) / 2 = 430.5 m

5) ∴ Frequency (f) = $\frac{\text{No of cycles}}{\text{Time}}$ × number of gear's teeth (n)

No. cycles = (120 × 300) / 100 = 360 cycles

6) The figure shows two waves of length 20 cm.

∴ The wavelength (λ) = 10 cm = 0.1 m

∴ Wave velocity (V) = Wavelength (λ) × Wave frequency (F)

= 0.1 × 25 = 2.5 m/sec

Answer Exam 1 - Lesson 1

1- C 2-C 3- d 4-C 5- C

Put (√) or (X) and correct the wrong ones:

1-X 2-X 3-X

Complete the following statements:

1-Rough - low

2-Increase - quarter

Give reasons for :

1-Bec. sound travel as spheres of compression and rarefaction

Mention the relationship between each of the following:

Directly with the square of amplitude

Answer Exam 2 - Lesson 1

Choose the correct answer:

1- C 2- d 3-b (sharper) 4- c. (Sonic)

Write the scientific term of each of the following:

1-Watt/m^2 2- Infrasonic waves 3- savart wheel 4- sound quality 5- sound

Give reasons for :

1-Bec. as the distance decrease the intensity of sound increase

2-Bec. man can hear only sounds frequencies between 20 : 20000 Hz

3-used in breaking down kidney stones – determination of the sex of embryo

Answer Exam Lesson 2

Choose the correct answer:

1- Violet
2- d- (increase four times)

Write the scientific term of each of the following:

1- transparent
2- light intensity
3- triangular prism
4- red

Complete the following statements:

1- covered by light in one second
2- crests and troughs
3- transparent – straight
4- thickness – decrease

Give reasons for :

1- Bec. black honey is an opaque medium doesn't allow light to pass through
3- Bec. it is a white light consists of seven spectrum colours

What happens when ...?

2- Cant pass through the opaque medium

Exam 1 - Lesson 3

Choose the correct answer:

1- C (60) 2- water to air 3-optical density

Write the scientific term of each of the following:

1- Emergent angle
2- Refractive index of medium
3- Reflected light ray
4- First law of light reflection

Complete the following statements:

1-Regular & irregular

2-Mirage

Give reasons for :

1-Bec. the angle of incident = the angle of reflection = zero

2-Bec . it is The ratio between the velocity of light through air to the velocity of light through another transparent medium.

What happens when ...? it appears in a apparent position higher than its real position .

Exam 2 - Lesson 3

Choose the correct answer:

1-45 2- stainless sheet

Put (√) or (X) and correct the wrong ones:

1- . (√) 2- (x) 3-(x) 4- (√)

Complete the following statements:

3- Incident angle – incidence
4- -mirror - regular reflection.

Give reasons for :

1-Due to light refraction .

2-due to the change in the velocity of light between the two mediums .

What happens when ...?

1-It will refract near to the perpendicular line

2-Reflect on itself

What is meant by:

1- The ratio between the velocity of light through air to the velocity of light through water = 1.33.

2- The angle between the emergent ray and the perpendicular line = 30